A Comprehensive Analysis of the Mortality Experience of Hispanic Subgroups in the United States by Region of Origin and Nativity

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Abstract
The Hispanic Paradox in the United States refers to the persistent favorable health and mortality experience of Hispanic populations compared to non-Hispanic whites. This comparison conceals substantial variation in mortality by country of origin, nativity, and age. The current analysis examines adult mortality differentials by nativity among Mexicans, Puerto Ricans, Cubans, Dominicans, Central/South Americans and other Hispanics, compared to non-Hispanic whites. We use the National Health Interview Survey Linked Mortality Files pooled 1990-2009 to obtain sufficient sample of each subgroup. We find that among adults aged 25-64, several subgroups experience a mortality disadvantage relative to non-Hispanic whites, reflecting socioeconomic disadvantage. Among adults 65 and above, nearly all Hispanic subgroups experience lower adult mortality risks than non-Hispanic whites, although there is wide variation across subgroups. The most favorable outcomes occur for foreign-born Mexicans, Central/South Americans, and Dominicans. Our results provide a comprehensive assessment of the mortality experience of Hispanic subgroups.
In most populations, socioeconomic status (SES) exhibits a strong positive association with health; this relationship holds for a variety of measures of both socioeconomic status and health, which speaks to its relatively universal nature (Elo, 2009). Between populations, however, the SES-health relationship is less clear, particularly with respect to the Hispanic/Latino population in the United States. The Hispanic mortality paradox, as it is sometimes known, refers to the finding that Hispanics in the United States have health and mortality outcomes similar to those of non-Hispanic whites while having socioeconomic attainment similar to African-Americans (Fenelon, 2013; Hummer et al., 2000; Markides & Eschbach, 2011). In many studies, Hispanics exhibit higher life expectancy than non-Hispanic whites, as well as more favorable profiles with respect to non-fatal conditions such as cancer incidence and severity, heart disease, and hypertension (Eschbach et al., 2005; Singh & Siahpush, 2002).

Research during the 1990s and 2000s suggested that the combined analysis of the Hispanic/Latino population in the United States was, in some ways, a myth. Hispanics vary greatly in terms of place of birth and country of origin, socioeconomic background and attainment, English language orientation, geographic mobility, and health (Hall, 2013; Markides & Eschbach, 2005). The US Hispanic population has origins in many countries in Latin America and the Caribbean, and the migration history differs considerably across origin countries. While the largest waves of Mexican migration began in the 1960s and 1970s, large populations of immigrants from Central America came in the 1980s and South American migration began largely in the 1990s and 2000s. In addition, the experience of stratification differs considerably across Hispanic subgroups; while Mexicans experience the highest levels of socioeconomic disadvantage (Palloni & Arias, 2004), Puerto Ricans tend to be the most segregated from non-
Hispanic whites (Massey & Bitterman, 1985; Tienda & Fuentes, 2014). These patterns support the notion that comparing Hispanics as a whole to other race/ethnic groups in terms of mortality experience ignores substantial within-group variation (Hummer et al., 1999).

Although it is clear that many Hispanic subgroups experience lower adult mortality risks than non-Hispanic whites, there has not yet been a comprehensive analysis of the mortality experience of all Hispanic subgroups across a number of characteristics. The current study uses a large nationally-representative household survey linked to mortality follow-up to examine mortality risk for US Hispanics by region of origin, nativity, age, and gender. We focus on Mexicans, Puerto Ricans, Cubans, Dominicans, Central/South Americans, and other Hispanics. The analysis also compares US-born and foreign-born individuals in each origin subgroup.

Background

Explanations for the Hispanic mortality advantage historically fall into three main categories: data artifacts, migration effects, and cultural effects. The data artifacts hypothesis questions whether mortality data for Hispanics in the US, particularly immigrants, are of high enough quality to obtain accurate estimates; because Hispanic origin is often undercounted on US death certificates, standard mortality calculations for Hispanic populations may be biased (Arias et al., 2008). Nationally-representative surveys with prospective mortality follow-up have largely resolved issues of underreporting of Hispanic ethnicity on US death certificates (Fenelon, 2013; Lariscy et al., 2015). As a result, recent research has focused largely on the latter two explanations. The migration effects explanation draws attention to the selective processes governing both who comes to the US as well as who remains in the US over time (Palloni & Ewbank, 2004). Individuals who come to the United States are likely to be different from those who remain in their origin countries in ways that are relevant to health, which may help to offset
the negative effects of socioeconomic disadvantage, known as the healthy-migrant effect (Abraido-Lanza et al., 1999). Alternatively, older Hispanics may return to their countries of origin as their health declines, leaving a relatively healthy subset in the US, known as the salmon-bias effect (Ullmann et al., 2011). More recent research focusing on the role of cultural buffering suggests that aspects of Hispanic culture may provide health benefits and may help to shelter individuals from the deleterious effects of socioeconomic disadvantage (Eschbach et al., 2004). Scholars suggest that Hispanic communities may foster and maintain beneficial social, cultural, and behavioral characteristics in close-knit community enclaves (Markides & Eschbach, 2005; Osypuk et al., 2009).

The category Hispanic, first appeared on the US census in 1970. However, the category means little outside the US context, and the diversity of individuals categorized in the panethnic group “Hispanic” has grown along with immigration from many parts of Latin America. Existing explanations for the Hispanic Paradox implicitly consider Hispanics as a homogeneous group, which may be inappropriate given heterogeneity within the Hispanic origin population.

**Mortality of Hispanic subgroups**

Previous research on the mortality outcomes of individuals of Hispanic origin suggests that Hispanic subgroups exhibit considerable variation in the level of mortality. While many studies treat Hispanics as a singular group (Arias et al., 2008; Elo et al., 2004; Liao et al., 1998; Sorlie et al., 1993), they remain a heterogeneous group with respect to nativity, country of origin, socioeconomic background and experience, and cultural and behavioral orientation (Markides & Eschbach, 2011). The heterogeneity of the Hispanic population has also grown over time, as migration from Latin America to the US increased during the 1990s and early 2000s (Logan & Turner, 2013). Although Mexicans still comprise the majority of US Hispanics, the growth of
other national origins has led to increasing diversity of the Hispanic population in recent years. As a result, many recent studies suggest that Hispanics should not be considered as a singular group, since the processes that drive mortality outcomes may differ across subpopulations (Borrell & Lancet, 2012).

In examining mortality differences within the Hispanic population, some studies have expanded their analysis to include many region-of-origin populations. Hummer et al. (2000) used the National Health Interview Survey (NHIS) pooled from 1986-1995 to reveal modest variation in mortality experience among Hispanics by region of origin, finding that Puerto Ricans experience the highest mortality and Central/South Americans the lowest. Mexicans also have consistently favorable health outcomes relative to non-Hispanic whites (Abraido-Lanza et al., 1999; Sorlie et al., 1993). Indeed, the fact that Mexicans comprise nearly two-thirds of American Hispanics is an important reason for the observation that Hispanics have favorable mortality outcomes when considered as a whole (Fenelon, 2013).

Hispanics also differ in terms of nativity. In the 2000s, nearly half of all Hispanic individuals were born outside the United States, and Hispanics are the US largest immigrant group. The immigrant mortality paradox refers to the tendency for foreign-born populations to outlive their native-born counterparts despite lower socioeconomic status (Blue & Fenelon, 2011). A similar pattern is observed within Hispanic populations, and some research contends that the Hispanic paradox exists only for the foreign-born (Palloni & Morenoff, 2001). Although other studies find an advantage over non-Hispanic whites for US-born Hispanics, it is at best greatly diminished compared with that of foreign-born Hispanics (Singh & Siahpush, 2002). Palloni and Arias (2004) were able to consider both region of origin and nativity, examining Mexicans, Cubans, Puerto Ricans, and other Hispanics. They found statistically significant
mortality advantages only for foreign-born Mexicans and foreign-born other Hispanics. Borrell and Lancet (2012) examined a number of Hispanic subgroups by nativity, but were unable to detect statistical significance for many of the groups due to relatively small sample sizes, and thus their results were mixed. Furthermore, there has been very little study of the mortality experience of smaller groups, such as Dominicans. As a result, a comprehensive analysis of the mortality experience of Hispanic subgroups by both region of origin and nativity is warranted.

It is also possible that the mortality experience of Hispanic subgroups varies by age and gender. Although an advantage for many Hispanic subgroups is observed among older adults (Palloni & Arias, 2004), the experience of younger Hispanics is less clear. Some work suggests that particular Hispanic subgroups experience a mortality disadvantage at younger ages (Hummer et al., 2000), although the cause-of-death distribution at younger ages is distinct from that of old-age mortality. It may also be important to consider men and women separately, and most studies of the Hispanic paradox have stratified by gender. Because the processes of selective migration and immigrant assimilation are likely to differ for men and women (Palloni & Ewbank, 2004), we may expect that the pattern of mortality differs by gender as well.

This is the first study to provide a comprehensive portrait of mortality experience across 12 Hispanic subgroups, considering both region of origin and nativity. Our study extends previous work examining heterogeneity in the mortality experience of Hispanic subgroups. We demonstrate a significant range of mortality experience across subgroups, with some groups showing mortality experience similar to that of US-born non-Hispanic whites and others exhibiting a significant adult mortality advantage over whites. Our results confirm the notion that the “Hispanic Paradox” does not apply to all Hispanics, and that scholars must recognize important heterogeneity in mortality experience across Hispanic subgroups in future work.
Data

We use data from the restricted-use National Health Interview Survey Linked-Mortality Files (NHIS-LMF), covering the period 1990-2009 with mortality follow-up through the end of 2011. NHIS collects detailed demographic, behavioral, and health information in annual cross-sectional samples and is conducted by the National Center for Health Statistics (NCHS). NHIS-LMF matches deceased individuals to mortality vital statistics through stochastic linkage to the National Death Index (NDI). The primary benefit of the NHIS is the large and geographically-diverse sample. Each year, NHIS interviews around 100,000 individuals. Pooled each year between 1990 and 2009, the total sample becomes large enough to examine less numerous Hispanic subgroups than is possible with most surveys. Many of the Hispanic subgroups considered here make up less than 1% of the US population, which makes representative samples for these groups difficult to obtain in most data collection procedures. To ameliorate some of the problems with left censoring, individuals 18-24 are not permitted to age into the analytic sample, partially because individuals under age 18 at baseline are not eligible for interview and thus cannot enter the sample even if they reach 25 during follow-up. The total pooled sample includes 824,109 individuals and 168,342 deaths by the end of 2011. Table 1 provides a detailed description of the sample by Hispanic subgroup.

Hispanic Subgroups

NHIS respondents report their race and whether they are of Hispanic or Latino origin. Those that identify as Hispanic or Latino also report their specific Hispanic subgroup (if any). We consider six region-of-origin subgroups: Mexicans, Puerto Ricans, Cubans, Dominicans, Central/South Americans, and other Hispanics\(^1\). We also consider place of birth among

\(^1\) Other Hispanics include those not identifying as members of another group. This includes residual groups such as Spaniards, Hispanics of multiple origins, and Hispanics of unknown origin.
Hispanics, separating each origin group into foreign-born (FB) and US-born (USB) subgroups. Respondents are considered foreign-born if they were born outside the fifty states and the District of Columbia. For our purposes, Puerto Ricans born on the Island of Puerto Rico are considered foreign born, even though they are US citizens at birth. We combine information on Hispanic origin and nativity in order classify individuals into twelve Hispanic subgroups: USB (Mexican, Puerto Rican, Cuban, Dominican, Central/South American, other Hispanics), FB (Mexican, Puerto Rican, Cuban, Dominican, Central/South American, other Hispanics). US-born individuals who identify as white and as “not of Hispanic origin” are classified as non-Hispanic whites (hereafter “white”) and form the majority comparison group for the analysis.

Sociodemographic Controls

The analysis also adjust for demographic and socioeconomic characteristics: age, sex, level of education, marital status, family size, family income, employment status, and year of interview. Education is measured using a dichotomous variable denoting whether an individual has 12 years of education or less (low education) versus 13 years of education or more (high education). Education is largely the preferred measure of SES in social research on health since a value for education is available for all individuals regardless of labor force status and because it is completed in early adulthood and (usually) remains fixed throughout the life course (Elo 2009). Family income uses the restricted-use NHIS imputed income files to measure the ratio of respondents’ family income relative to the federal poverty line (<100% of the poverty line, 100%-399%, 400%+). Employment status is categorized as employed, unemployed, or not in the labor force.

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2 The meaning of education is likely to differ across national populations, and thus it is difficult to compare levels of education directly between US-born and foreign-born subgroups. Previous studies have found these differences have little effect on the estimation of mortality outcomes for Hispanics vis-à-vis whites (Hummer et al. 1999)
**Methods**

We use a hazard modeling approach to examine differences in mortality risk between non-Hispanic whites and Hispanic subgroups. Since the exact date of interview and death are available through the restricted-use file, the model uses a continuous-time proportional hazards procedure modeled using a Gompertz-distributed hazard function. The models estimate mortality differences among Hispanic subgroups and non-Hispanic whites focusing on two age groups: 25-64 and 65+. We run all models separately by sex and use sample weights adjusted for eligibility status in the mortality linkage.

**Results**

Table 1 presents descriptive statistics of the sample by Hispanic subgroup and nativity. Mexicans are the largest Hispanic subgroup, comprising 58% of all Hispanics in the sample. Central/South Americans are the next largest (10.5%), followed by Puerto Ricans (9.7%) and Cubans (7.1%). Other Hispanics make up 15% of Hispanics in the sample. 65% of Hispanics in the sample are foreign-born, although individual region-of-origin groups differ in their nativity composition. Subgroups also differ in their socioeconomic attainment, and not all Hispanic subgroups exhibit lower socioeconomic status than non-Hispanic whites. Although all foreign-born groups have lower levels of education and income than non-Hispanic whites, USB Cubans, Dominicans, and Central/South Americans show higher socioeconomic attainment. While 50% of non-Hispanic whites have at least 13 years of education, 63% of USB Cubans, 59% of USB Dominicans, and 67% of USB Central/South Americans have at least 13 years. FB Mexicans have particularly low levels of socioeconomic status, with more than 33% having family income below the federal poverty line. FB Puerto Ricans have the next highest poverty rate followed by
FB other Hispanics. Within each Hispanic subgroup, the foreign-born have lower socioeconomic status than the US-born.

The hazard models presented in Tables 2 and 3 examine differences in mortality risk between non-Hispanic whites and Hispanic subgroups by region of origin, nativity, age group, and gender. The results for men are shown in Table 2. The first two models consider individuals aged 25-64. Model 1 adjusts only for age and year of interview (unadjusted model), while Model 2 includes socioeconomic covariates (adjusted model). For men in the unadjusted model, many subgroups experience higher mortality risk than non-Hispanic whites, including USB and FB Mexicans and Puerto Ricans. Adjusting for socioeconomic covariates mediates the disadvantage of these groups, suggesting that younger adult Mexicans and Puerto Ricans experience mortality disadvantage as a function of socioeconomic disadvantage. Only FB Central/South Americans and other Hispanics experience lower risks in this age group. Models 3 (unadjusted model) and 4 (adjusted model) examine mortality among adults aged 65 and above. In this age group no Hispanic subgroups experience higher mortality risks than non-Hispanic whites in the unadjusted model. However, the only USB subgroup with a mortality advantage is Mexicans. In the adjusted model, nearly every subgroup exhibits an advantage relative to non-Hispanic whites, including all FB subgroups and USB Mexicans, Cubans, and other Hispanics. FB Dominicans have the most favorable mortality outcomes of any group in both the unadjusted and adjusted models.

Among women (Table 3), the pattern of Hispanic advantage and disadvantage across subgroups is similar to that of men. Among women aged 25-64, unadjusted for socioeconomic status, several subgroups experience higher mortality risk than non-Hispanic whites including FB Mexicans, USB and FB Puerto Ricans, and USB other Hispanics (Model 1). However, unlike for men, Mexicans’ and FB Puerto Ricans’ disadvantage is reversed and becomes a mortality
advantage in the adjusted model (Model 2). All FB subgroups have an advantage in the adjusted model. Among women aged 65 and above, all FB subgroups and USB Mexicans have an advantage in the unadjusted model (Model 3). In the adjusted model (Model 4), advantages expand for these subgroups, but no other USB subgroups exhibit an advantage. FB Dominicans again experience the lowest mortality risk of any subgroup.

Table 4 simplifies the findings with respect to the mortality advantage (or disadvantage) of each Hispanic subgroup compared to non-Hispanic whites. Among adults aged 25-64, many subgroups experience mortality disadvantages, and these disadvantages largely reflect socioeconomic disadvantage, and are not present in the adjusted models. Among older adults, all FB subgroups have an advantage over non-Hispanic whites, and many USB subgroups exhibit an advantage in the adjusted model. FB Central/South Americans and other Hispanics exhibit consistent advantages across models for both men and women, middle-aged and older adults, and both unadjusted and adjusted for socioeconomic covariates. Although much of the focus of the Hispanic paradox is on Mexican-origin populations, Dominicans, Central/South Americans, and other Hispanics have the most consistent mortality advantage across age, gender, and nativity.

Discussion

Although research on the Hispanic mortality paradox has often treated the more than 50 million individuals of Hispanic origin in the US as a singular group, there is significant heterogeneity in this population. Net of socioeconomic and demographic characteristics, nearly every Hispanic region-of-origin group, both US born and foreign born, experiences lower adult mortality risks than the US-born non-Hispanic white population. Consistently low mortality risk is found among both US-born and foreign-born Mexicans, and foreign-born Cubans, Dominicans Central/South Americans, and other Hispanics. Although the pattern of our findings is similar to
those of previous scholars (Abraido-Lanza et al., 1999; Hummer et al., 2000; Sorlie et al., 1993), we are able to detect statistical differences between most subgroups and non-Hispanic whites, and are able to obtain stable estimates for Dominican and Central/South American immigrants. Our results provide the largest amount of existing evidence for an adult mortality advantage for many different Hispanic subgroups relative to non-Hispanic whites, and for mortality differentials among subgroups. Our results simultaneously provide evidence for the consistency of the Hispanic mortality advantage over non-Hispanic whites as well as evidence that the advantage does not apply equally to all Hispanic subgroups.

It is well known that recent immigrants to the US have the most favorable health profile (Abraido-Lanza et al. 1999), while that of second generation individuals approaches the non-Hispanic white norm (Antecol and Bedard 2006; Bethel and Schenker 2005). Exposure to the United States from birth may increase the likelihood that US-born individuals adopt less healthy behaviors characteristic of their American socioeconomic strata (Akresh, 2007). Overall, foreign-born subgroups have more favorable outcomes than their US-born counterparts, almost without exception. We find advantages for each foreign-born subgroup at older ages for both men and women. Alternatively, Mexicans are the only US-born subgroup to demonstrate a consistent advantage over non-Hispanic whites at older ages for both men and women. The advantages are quite large for some groups, corresponding to adult life expectancy advantages of more than 8 years, while others exhibit mortality risks similar to those of non-Hispanic whites.

Another important dimension of the heterogeneity of Hispanic mortality experience is age. Many Hispanic subgroups, particularly Mexicans and Puerto Ricans experience a mortality disadvantage relative to whites between ages 25 and 64. This mortality disadvantage is mediated by socioeconomic status, primarily due to lower levels of education and higher rates of poverty
in these populations. Similarly, the mortality advantage of many other Hispanic subgroups would be even larger if they did not experience considerable socioeconomic disadvantage, a facet of the “weak Hispanic Paradox” (Hummer et al., 1999). These findings provide important nuance for understanding the Hispanic mortality paradox, and demonstrate that an advantage for Hispanic subgroups at older ages does not necessarily extend to younger ages. Palloni and Arias (2004) found that the advantage for foreign-born Mexicans expanded substantially at older ages, which they interpreted as evidence for return migration of older individuals. Instead, others suggest this may reflect the greater impact of socioeconomic disadvantage on mortality risk among younger adults than older adults (Herd, 2006).

Finally we also examine differences by gender. Despite existing evidence that the health dynamics of Hispanic immigrants varies by gender (Parrado & Flippen, 2005), we find a strikingly similar pattern of mortality across subgroups for both men and women. Differences do exist with respect to age. Subgroups tend to have more consistent advantages over non-Hispanic whites among women at ages 25-64, while men tend to have slightly more consistent advantages at older ages. However, the high degree of similarity in the pattern for both men and women suggests that gender differences in the determinants of mortality for US Hispanics are not likely to be large.

The primary contribution of this study is a comprehensive analysis of the mortality experience of Hispanic subgroups compared to non-Hispanic whites, highlighting the significant variation in mortality experience by region of origin, nativity, and age among Hispanic subgroups. The significance of this finding should not be discounted in research on the Hispanic Paradox in the United States, since many studies treat the Hispanic population as having a singular mortality experience despite substantial heterogeneity (Hayward et al., 2014; Ruiz et al.,
The term “Hispanic Paradox” appears increasingly problematic; Hispanics are not “Hispanic” until they enter the United States and are classified in the panethnic by the US Census (Kim & White, 2010). Immigrants from Spanish-speaking countries of Latin America and the Caribbean may have little culturally in common but are classified as a unified group. However, we demonstrate the importance of a critical perspective on the use of the panethnic “Hispanic” category for research on health and mortality.

**Limitations**

The primary limitation of the analysis is that we are unable to specify the reasons for the advantages of individual subgroups. Some advantages may reflect health related behaviors (Fenelon, 2013), it is possible that advantages for other groups may reflect patterns of health-selective migration. Although the analysis contributes to the literature in providing the most comprehensive analysis of the Hispanic mortality paradox to date, future work must investigate whether explanations for the mortality advantage vary across Hispanic subgroups.

The analysis is limited by two well-known data quality issues. First, record linkage between NHIS and NDI may differ in quality across Hispanic subgroups, with foreign-born Hispanics experiencing lower matching quality than non-Hispanic whites (Lariscy, 2011). The true impact of linkage differences on mortality differences is difficult to determine, specifically because differing linkage rates combine both differences in linkage given death and differences in death risks. Although record linkage likely differs by nativity, it is unknown whether it would vary by region of origin. Second, the current data cannot completely address the issue of health-selective return migration. Foreign-born individuals may return to their origin countries prior to death both leaving their death unobserved in US vital statistics and leaving a relatively healthy population remaining in the US. However, certain populations, such as foreign-born Cubans are
unable to return to their origin country (Abraido-Lanza et al., 1999). Also, a previous study (Turra and Elo, 2008) demonstrated that the magnitude of return migration would need to be very large to explain the substantial mortality differentials found in most studies.

Finally, the analysis covers a relatively long time series, with interviews stretching across a 19-year period and mortality covering 21 years. Considering such a long period makes it possible that death occurs many years following interview, and the existing data are unable to address changes in individual characteristics during the course of follow-up. The inclusion of a control for year of interview helps to assure that the observed mortality differences do not reflect secular trends in mortality over time, although it remains an issue cross-sectional data cannot completely address.

Conclusions

The Hispanic paradox represents a theoretically significant finding for social science research because a group with lower socioeconomic status experiences better health outcomes than the high-status majority. Expanding our knowledge of this process not only informs research on the health and mortality outcomes of Hispanics but also the nuances of the relationship between socioeconomic status and health. As the Hispanic population has grown in the past several decades, it has also become more diverse, in terms of age, nativity, and country of origin. With this increase in diversity has come growth in Hispanic immigrant population across the United States, with new destinations emerging in places as far apart as Seattle and Atlanta. These trends have also led to increased interest in the health and mortality experience of Hispanic populations across the US. Many of the subgroups that exhibit the largest mortality advantages are also those that are growing the fastest (Fenelon & Blue, 2014), including Central Americans, South Americans, and Dominicans. This shift is combined with the aging of many
Hispanic subgroups, whose mortality experience will become more relevant for the overall longevity of the US population in the coming decades.

References


Table 1: Descriptive statistics of National Health Interview Survey Sample by Hispanic Subgroup 1990-2009

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<thead>
<tr>
<th></th>
<th>US-born</th>
<th>Foreign-born</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>non-Hispanic white</td>
<td>Mexican</td>
</tr>
<tr>
<td>n</td>
<td>726,805</td>
<td>41,534</td>
</tr>
<tr>
<td>Number died</td>
<td>129,608</td>
<td>4,078</td>
</tr>
<tr>
<td>Mean Age</td>
<td>49.8</td>
<td>43.8</td>
</tr>
<tr>
<td>Male %</td>
<td>47.4</td>
<td>46.0</td>
</tr>
<tr>
<td>Education (%)</td>
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<tr>
<td>12 years or less</td>
<td>49.2</td>
<td>65.2</td>
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<td>13 years or more</td>
<td>50.8</td>
<td>34.8</td>
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<td>Poverty Status (%)</td>
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<td>Below 100% of Poverty</td>
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<td>100%-399%</td>
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<td>400% and above</td>
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<tr>
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<td>Unemployed</td>
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<td>Not in Labor Force</td>
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<td>30.0</td>
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<tr>
<td>Marital Status (%)</td>
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<tr>
<td>Married</td>
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<td>Divorced</td>
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<tr>
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<td>Mexican</td>
<td>56,786</td>
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<td>Puerto Rican</td>
<td>3,833</td>
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<td>Cuban</td>
<td>41.1</td>
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<td>Dominican</td>
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<td>Education (%)</td>
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<td>12 years or less</td>
<td>87.2</td>
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<td>13 years or more</td>
<td>12.8</td>
<td>26.0</td>
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<td>Poverty Status (%)</td>
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<td>Below 100% of Poverty</td>
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<td>29.9</td>
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<td>100%-399%</td>
<td>59.8</td>
<td>54.9</td>
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<td>400% and above</td>
<td>6.7</td>
<td>15.2</td>
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<tr>
<td>Never Married</td>
<td>12.9</td>
<td>16.9</td>
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* Few deaths among USB Dominicans not shown.
### Table 2: Hazard Ratios of Mortality by Hispanic subgroup among Men

<table>
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<th>Subgroup</th>
<th>Ages 25-64</th>
<th>Ages 65+</th>
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<tr>
<td></td>
<td>Model 1</td>
<td>Model 2</td>
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<tr>
<td>USB NH White</td>
<td>1.00</td>
<td>1.00</td>
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<tr>
<td>USB Mexican</td>
<td>1.22 (1.15-1.30)**</td>
<td>1.03 (0.96-1.10)**</td>
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<tr>
<td>FB Mexican</td>
<td>1.18 (1.11-1.25)*****</td>
<td>0.97 (0.91-1.03)**</td>
</tr>
<tr>
<td>USB Puerto Rican</td>
<td>1.24 (1.03-1.49)***</td>
<td>1.05 (0.88-1.26)**</td>
</tr>
<tr>
<td>FB Puerto Rican</td>
<td>1.32 (1.17-1.48)*****</td>
<td>0.90 (0.80-1.01)**</td>
</tr>
<tr>
<td>USB Cuban</td>
<td>0.77 (0.52-1.14)</td>
<td>0.74 (0.50-1.09)**</td>
</tr>
<tr>
<td>FB Cuban</td>
<td>1.00 (0.87-1.15)</td>
<td>0.93 (0.81-1.07)**</td>
</tr>
<tr>
<td>USB Dominican</td>
<td>0.63 (0.09-4.52)</td>
<td>0.50 (0.07-3.63)**</td>
</tr>
<tr>
<td>FB Dominican</td>
<td>0.73 (0.43-1.23)</td>
<td>0.54 (0.32-0.92)***</td>
</tr>
<tr>
<td>USB Central/South American</td>
<td>0.64 (0.31-1.31)</td>
<td>0.65 (0.33-1.29)**</td>
</tr>
<tr>
<td>FB Central/South American</td>
<td>0.48 (0.38-0.60)*****</td>
<td>0.45 (0.36-0.57)*****</td>
</tr>
<tr>
<td>USB other Hispanic</td>
<td>1.14 (1.02-1.30)***</td>
<td>1.02 (0.83-0.99)**</td>
</tr>
<tr>
<td>FB other Hispanic</td>
<td>0.59 (0.52-0.67)*****</td>
<td>0.52 (0.46-0.59)*****</td>
</tr>
</tbody>
</table>

**Sociodemographic Characteristics**

**Education**

- 12 years or fewer: 1.00
- 13 years or more: 0.71 (0.69-0.73)***** 0.86 (0.84-0.88)*****

**Employment Status**

- Employed: 1.00
- Unemployed: 1.38 (1.30-1.47)***** 1.08 (0.92-1.26)
- Not in Labor Force: 2.13 (2.07-2.20)***** 1.38 (1.34-1.43)*****

**Family Income**

- Below 100% of Poverty: 1.00
- 100%-399%: 0.81 (0.78-0.84)***** 0.86 (0.83-0.90)*****
- 400% and above: 0.60 (0.58-0.63)***** 0.71 (0.67-0.74)*****

**Household Size**

- 0.96 (0.95-0.97)***** 1.01 (1.00-1.03)

**Marital Status**

- Married: 1.00
- Divorced/separated: 1.48 (1.42-1.53)***** 1.30 (1.24-1.36)*****
- Widowed: 1.45 (1.34-1.57)***** 1.16 (1.12-1.20)*****
- Never Married: 1.49 (1.43-1.55)***** 1.16 (1.11-1.23)*****

**Number of Observations**

- 411,184
- 84,941

Notes: Models 1 and 3 control only for age and year of interview (unadjusted results). Models 2 and 4 add socioeconomic covariates: education, family income, employment status, marital status, household size. FB=foreign-born, USB=US-born. 95% confidence intervals shown in parentheses.

* p<0.05, ** p<0.01, *** p<0.001
<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Ages 25-64</th>
<th>Ages 65+</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model 1</td>
<td>Model 2*</td>
</tr>
<tr>
<td>USB NH White</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>USB Mexican</td>
<td>0.98 (0.91-1.06)***</td>
<td>0.80 (0.74-0.87)***</td>
</tr>
<tr>
<td>FB Mexican</td>
<td>1.28 (1.19-1.38)***</td>
<td>0.87 (0.81-0.94)***</td>
</tr>
<tr>
<td>USB Puerto Rican</td>
<td>1.22 (1.01-1.49)*</td>
<td>0.97 (0.80-1.18)</td>
</tr>
<tr>
<td>FB Puerto Rican</td>
<td>1.32 (1.18-1.50)***</td>
<td>0.81 (0.72-0.92)***</td>
</tr>
<tr>
<td>USB Cuban</td>
<td>1.26 (0.84-1.89)</td>
<td>1.29 (0.87-1.93)</td>
</tr>
<tr>
<td>FB Cuban</td>
<td>0.74 (0.62-0.89)***</td>
<td>0.64 (0.53-0.77)***</td>
</tr>
<tr>
<td>USB Dominican</td>
<td>1.90 (0.48-7.59)</td>
<td>1.49 (0.36-6.04)</td>
</tr>
<tr>
<td>FB Dominican</td>
<td>0.48 (0.29-0.80)**</td>
<td>0.29 (0.17-0.48)*****</td>
</tr>
<tr>
<td>USB Central/South American</td>
<td>1.02 (0.42-2.45)</td>
<td>1.01 (0.42-2.40)</td>
</tr>
<tr>
<td>FB Central/South American</td>
<td>0.44 (0.35-0.56)***</td>
<td>0.36 (0.28-0.46)***</td>
</tr>
<tr>
<td>USB other Hispanic</td>
<td>1.23 (1.08-1.41)**</td>
<td>1.07 (0.94-1.22)</td>
</tr>
<tr>
<td>FB other Hispanic</td>
<td>0.59 (0.51-0.67)***</td>
<td>0.45 (0.39-0.52)***</td>
</tr>
</tbody>
</table>

**Sociodemographic Characteristics**

<table>
<thead>
<tr>
<th>Education</th>
<th>Ages 25-64</th>
<th>Ages 65+</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 years or fewer</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>13 years or more</td>
<td>0.75 (0.73-0.77)***</td>
<td>0.86 (0.84-0.88)***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Employment Status</th>
<th>Ages 25-64</th>
<th>Ages 65+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employed</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Unemployed</td>
<td>1.26 (1.16-1.37)***</td>
<td>1.27 (1.05-1.52)***</td>
</tr>
<tr>
<td>Not in Labor Force</td>
<td>1.83 (1.77-1.88)***</td>
<td>1.50 (1.45-1.56)***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Family Income</th>
<th>Ages 25-64</th>
<th>Ages 65+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Below 100% of Poverty</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>100%-399%</td>
<td>0.71 (0.69-0.74)***</td>
<td>0.91 (0.88-0.93)***</td>
</tr>
<tr>
<td>400% and above</td>
<td>0.50 (0.47-0.52)***</td>
<td>0.80 (0.77-0.82)***</td>
</tr>
<tr>
<td>Household Size</td>
<td>0.95 (0.94-0.96)***</td>
<td>1.04 (1.03-1.05)***</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marital Status</th>
<th>Ages 25-64</th>
<th>Ages 65+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Married</td>
<td>1.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Divorced/separated</td>
<td>1.42 (1.37-1.47)***</td>
<td>1.32 (1.27-1.37)***</td>
</tr>
<tr>
<td>Widowed</td>
<td>1.42 (1.35-1.48)***</td>
<td>1.25 (1.22-1.28)***</td>
</tr>
<tr>
<td>Never Married</td>
<td>1.59 (1.51-1.67)***</td>
<td>1.27 (1.21-1.33)***</td>
</tr>
</tbody>
</table>

| Number of Observations        | 454,617    | 117,009  |

* Notes: Models 1 and 3 control only for age and year of interview (unadjusted results). Models 2 and 4 add socioeconomic covariates: education, family income, employment status, marital status, household size. FB=foreign-born, USB=US-born. 95% confidence intervals shown in parentheses.
* p<0.05,  ** p<0.01,  *** p<0.001
<table>
<thead>
<tr>
<th>Subgroup</th>
<th>Unadjusted</th>
<th>Adjusted</th>
<th>Unadjusted</th>
<th>Adjusted</th>
</tr>
</thead>
<tbody>
<tr>
<td>USB Mexican</td>
<td>Higher for men</td>
<td>Lower for women</td>
<td>Lower</td>
<td>Lower</td>
</tr>
<tr>
<td>FB Mexican</td>
<td>Higher</td>
<td>Lower for women</td>
<td>Lower</td>
<td>Lower</td>
</tr>
<tr>
<td>USB Puerto Rican</td>
<td>Higher</td>
<td>No Diff.</td>
<td>No Diff.</td>
<td>No Diff.</td>
</tr>
<tr>
<td>FB Puerto Rican</td>
<td>Higher</td>
<td>Lower for women</td>
<td>Lower for women</td>
<td>Lower</td>
</tr>
<tr>
<td>USB Cuban</td>
<td>No Diff.</td>
<td>No Diff.</td>
<td>No Diff.</td>
<td>Lower for men</td>
</tr>
<tr>
<td>FB Cuban</td>
<td>Lower for women</td>
<td>Lower for women</td>
<td>Lower</td>
<td>Lower</td>
</tr>
<tr>
<td>USB Dominican</td>
<td>No Diff.</td>
<td>No Diff.</td>
<td>No Diff.</td>
<td>No Diff.</td>
</tr>
<tr>
<td>FB Dominican</td>
<td>Lower for women</td>
<td>Lower for women</td>
<td>Lower</td>
<td>Lower</td>
</tr>
<tr>
<td>USB Central/South American</td>
<td>No Diff.</td>
<td>No Diff.</td>
<td>No Diff.</td>
<td>No Diff.</td>
</tr>
<tr>
<td>FB Central/South American</td>
<td>Lower</td>
<td>Lower</td>
<td>Lower</td>
<td>Lower</td>
</tr>
<tr>
<td>USB other Hispanic</td>
<td>Higher</td>
<td>No Diff.</td>
<td>No Diff.</td>
<td>Lower for men</td>
</tr>
<tr>
<td>FB other Hispanic</td>
<td>Lower</td>
<td>Lower</td>
<td>Lower</td>
<td>Lower</td>
</tr>
</tbody>
</table>

Notes:
1 Differences refer to statistically significant higher or lower mortality risk of the Hispanic subgroup with respect to non-Hispanic white men and women of the same age. Comparisons with no sex specified means that the advantage/disadvantage pertains to both men and women.
2 Unadjusted models control only for age and year of interview.
3 Adjusted models control for socioeconomic covariates: education, family income, employment status, marital status, household size.